UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

August 13, 2001

Greg Pratschner
U.S. Fish and Wildlife Service
Leavenworth National Fish Hatchery Complex
12790 Fish Hatchery Road
Leavenworth, Washington 98826

Re: Biological Opinion for the Foghorn Ditch Dredging Project in the Methow River Basin (NMFS No. WSB-01-178)

Dear Mr. Pratschner:

The attached document transmits the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) on the proposed Foghorn Ditch Dredging Project in the Methow River Basin in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.). The U.S. Fish and Wildlife Service had determined that the proposed actions are likely to adversely affect the Upper Columbia River (UCR) steelhead (*Oncorhynchus mykiss*) and UCR spring chinook salmon (*O. tshawytscha*) Evolutionarily Significant Units (ESU). Formal consultation was initiated for this project on August 6, 2001.

This BO reflects formal consultation and an analysis of effects covering the UCR steelhead and UCR spring chinook salmon in both the Foghorn ditch and the Methow River adjacent to the Winthrop National Fish Hatchery, Winthrop, Okanogan County, Washington. The BO is based on information provided in the biological assessment sent to NMFS by the U.S. Fish and Wildlife Service on April 30, 2001 and amended on August 6, 2001, and subsequent information transmitted by telephone conversations and electronic mail. A complete administrative record of this consultation is on file at the Washington State Habitat Branch Office.

The NMFS concludes that implementation of the proposed projects is not likely to jeopardize the continued existence of UCR steelhead or UCR spring chinook salmon or result in the destruction or adverse modification of their critical habitat. In your view, please note that the incidental take statement, which includes reasonable and prudent measures and terms and conditions, was designed to minimize take.

If you have any questions, please contact Dennis Carlson of the Washington State Habitat Branch Office at (360) 753-5828.

Sincerely,

Michael R Crouse

Donna Darm
Acting Regional Administrator

Endangered Species Act - Section 7 Consultation

BIOLOGICAL OPINION

and

Magnuson-Stevens Fishery Conservation Management Act Consultation

Foghorn Ditch Dredging Project in the Methow River Basin
NMFS No. WSB-01-178

Agency: U.S. Fish and Wildlife Service

Consultation
Conducted By: National Marine Fisheries Service
Northwest Region
Washington State Habitat Branch

Approved _____ Date _____
Donna Darm
Acting Regional Administrator

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I. BACKGROUND AND DESCRIPTION OF THE PROPOSED PROJECT

A. Background

On May 4, 2001, the National Marine Fisheries Service (NMFS) received a Biological Assessment (BA) and request for section 7 consultation from the U.S. Fish and Wildlife Service (USFWS). The BA described a proposal to repair the Foghorn dam, a low head rock and boulder structure, located in the Methow River at river mile (RM) 51 at Winthrop, Okanogan County, Washington. The in-river structure provides water to the Foghorn Ditch Irrigation Company diversion for consumptive crop irrigation and domestic uses and for non-consumptive uses by both the Winthrop National Fish Hatchery and the Methow State Fish Hatchery.

Subsequently, additional information (an amended BA) necessary to complete the consultation was provided to NMFS on August 6, 2001. The amended BA contained only the proposal to dredge a 0.25 mile section of the diversion ditch that extends from the intake site on the Methow River to the fish screens at the Methow State Fish Hatchery. Channel dredging would increase the flow through the ditch up to an additional 20 cubic feet per second (cfs). The former proposal to reconstruct the Foghorn dam across the Methow River was removed from further review.

The Foghorn ditch has filled in with sand and sediment, thus its capacity to deliver water to all users has been reduced. This condition coupled with the existing drought and low water flow in the Methow River this year could result in a situation where there is not enough water to sustain hatchery operations. Both hatcheries now utilize groundwater as their primary source of water, with river flow augmentation. If minimal surface water supplies are unavailable, the hatchery will not be able to maintain their production programs on available groundwater. Dependence upon river water increases in late summer and continues to increase until spring fish releases. It is also imperative that the hatchery maintain a steady supply of river water during the period of December through February when low air and water temperatures can freeze the water in the ditch, leading to potential fish mortalities in the hatchery. It should be noted that the proposal to divert an additional 20 cfs from the Methow River is not an increase or over-appropriation of water rights for either fish hatchery. It is below the combined surface water rights of the Winthrop hatchery (50 cfs) and the Methow hatchery (18 cfs). In addition to a surface water share right, the USFWS also has a contract with the Foghorn Ditch Irrigation Company to maintain the diversion ditch from the Methow River, thus creating a federal nexus and the need for section 7 consultation.

The USFWS has determined that the proposed action will occur within the evolutionarily significant unit (ESU) and critical habitat of endangered Upper Columbia River (UCR) steelhead (*Oncorhynchus mykiss*) and endangered UCR spring chinook salmon (*O. tshawytscha*). The USFWS determined that the proposed actions were likely to adversely affect both UCR steelhead and spring chinook salmon.

This biological opinion (BO) reflects the results of the formal consultation process. Formal consultation involves correspondence and communication between NMFS and the lead action

agency to supplement and clarify the information contained within the BA. A summary of key events is provided below.

- Receipt of the draft BA from the USFWS on May 4, 2001.

- A May 29, 2001 conference call between Julie Collins of the USFWS and Dennis Carlson of NMFS to discuss informational needs to complete the BA.

- A July 12, 2001 conference call with USFWS hatchery personnel and Dennis Carlson to discuss project options and time frames for completing consultation and project implementation this year.

- Receipt of an August 6, 2001 E-mail message with an amended BA (dated August 6, 2001) attachment.

In addition to the above, several phone conversations have occurred between Julie Collins and Dennis Carlson over the past year or longer regarding other potential project proposals/alternatives to increase water delivery to the Winthrop hatchery.

The objective of this BO is to determine whether the proposed project is likely to jeopardize the continued existence of the UCR steelhead and UCR spring chinook salmon, or result in the destruction or adverse modification of their designated critical habitat.

B. Description of the Proposed Action

The USFWS proposes to dredge a 0.25 mile by 12 ft. wide section of the Foghorn irrigation ditch that extends from its intake at the Methow River (RM 51) to the fish screens at the Methow State Fish Hatchery. The proposed work would increase the delivery capacity of the ditch, facilitating the diversion of an additional 20 cfs of flow from the Methow River. Dredging would entail the use of a backhoe excavator to remove from one to two feet depth of sand and silt channel deposits. Approximately 880 cubic yards of material would be dredged from the ditch. The excavator would operate from the south bank of the ditch and all excavated material would be deposited on the John Van Der Molen property, located along the north bank of the ditch. Project work is estimated to require one week, beginning the week of August 13, 2001.

The use of a backhoe excavator is not expected to impact any riparian vegetation, remove any large woody debris, or remove large boulders.

Prior to initiating any dredging, flows in the ditch would be reduced to 3-5 cfs to maintain sufficient flow for coho salmon rearing at the Winthrop hatchery, and to facilitate the removal of fish from the ditch. An aluminum perforated (3/32" diameter) plate screen or similar sized screen material would be placed across the ditch intake at the existing coarse rack to temporarily prevent fish from entering the area during the dredging work. Fisheries personnel would then seine the ditch channel, gently herding any juvenile fish to a bypass channel located in the

Winthrop hatchery screen chamber that returns flow (and fish) to the Methow River approximately 1.3 miles downriver. No capturing or handling of fish is expected to occur during the seining operation.

The proposed project incorporates several conservation measures (i.e., timing work window to avoid spawning season, a snorkel survey of the 1.3 mile bypass reach, use of fine mesh seines to herd fish out of the work channel, use of a sediment settling channel at the Winthrop hatchery to preclude sediment delivery down the bypass channel to the Methow River, etc.) into its design to avoid or minimize construction impacts to the federally listed species under review. Additional guidelines and work conditions are set forth by the Washington Department of Fish and Wildlife in their Hydraulic Permit Approval.

II. STATUS OF THE SPECIES AND CRITICAL HABITAT

A. UCR Steelhead

UCR steelhead were listed as endangered species under the ESA on August 18, 1997 (62 Fed. Reg. 43937). Critical habitat for the UCR steelhead was designated on February 16, 2000 (65 Fed. Reg. 7764; February 16, 2000). The listing status, biological information, and other information for the UCR steelhead is further described in Attachment 1.

Range-wide factors for the decline of west coats steelhead stocks are primarily attributed to the destruction and modification of habitat, overutilization for recreational purposes, and natural and human-made factors (NMFS 1996a, 1996b, 1997). Forestry, agriculture, mining, and urbanization have degraded, simplified, and fragmented habitat. Water diversions for agriculture, flood control. Domestic, and hydropower purposes (including the Columbia River Basin) have greatly reduced or eliminated historically accessible habitat. Studies estimate that during the last 200 years, the lower 48 states have lost approximately 53% of all wetlands and the majority of the rest are severely degraded (Gregory & Bisson 1997). Washington and Oregon's wetlands are estimated to have diminished by one-third, while California has experienced a 91% loss of its wetland habitat (NRC 1996).

Loss of habitat complexity has also contributed to range-wide decline of steelhead. In portions of some national forests in Washington, there has been a 58% reduction in large deep pools due to sedimentation and loss of pool-forming structures such as boulders and large wood (mcIntosh et al. 1994). Sedimentation from land use activities is recognized as a primary cause of habitat degradation in the range of west coast steelhead (62 Fed. Reg. 43942).

Steelhead of this listed ESU that are likely to be adversely affected by the proposed action range in the Methow River and its tributaries. The UCR Basin steelhead ESU occupies the Columbia River Basin upstream from the confluence with the Yakima River, Washington, to the United States-Canada border. The geographic area occupied by this ESU forms part of the larger Columbia Basin Ecoregion (Omernik 1987). The Methow River is in the Okanogan Highlands

Physiographic Province. The river valleys in this region are deeply dissected and maintain low gradients except in extreme headwaters. The climate in this area includes extremes in temperatures and precipitation, with most precipitation falling in the mountains as snow. Streamflow in this area is provided by melting snowpack, groundwater, and runoff from alpine glaciers.

The proposed action would occur within designated critical habitat for UCR steelhead. Defining specific river reaches that are critical for steelhead is difficult because of the low abundance of the species and of our imperfect understanding of the species' freshwater distribution, both current and historical (65 Fed. Reg. 7764: February 16, 2000). Based on consideration of the preferred approach to identifying critical habitat for steelhead is to designate all areas accessible to the species within the range of specified river basins in this ESU (65 Fed. Reg. 7764: February 16, 2000).

Essential features of steelhead critical habitat include adequate substrate, water quality, water quality., water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. Good summaries of the environmental parameters and freshwater factors have contributed to the decline of steelhead can be found in reviews by Pauley *et al*, (1986); NMFS (1996); NMFS (1996a, 1996b, 1997); and Spence *et al*, (1996).

Estimates of historical (pre-1960s) steelhead abundance specific to this ESU are available from fish counts at dams. Counts at Rock Island Dam from 1933 to 1959 averaged 2,600 to 3,700, suggesting a pre-fishery run size in excess of 5,000 adults for tributaries above Rock Island Dam (Chapman *et al*, 1994). Recent five-year (1989-1993) average natural escapements for the Methow and Okanogan rivers was 450 steelhead. Recent average total escapements for this stock was 2,400 (62 Fed. Reg. 43949; August 18, 1997).

Steelhead in the Upper Columbia River ESU continue to exhibit low abundances, both in absolute numbers and in relation to numbers of hatchery fish throughout the region. Review of the most recent data indicates that natural steelhead abundance has declined or remained low and relatively constant in the major river basins in this ESU (Wenatchee, Methow, Okanogan) since the early 1990s (NMFS 1996a, 1996b, 1997). Estimates of natural production of steelhead in the ESU are well below replacement (approximately 0.3:1 adult replacement ratios estimated in the Wenatchee and Entiat rivers) (62 Fed. Reg. 43949; August 18, 1997). These data indicate that natural steelhead populations in the Upper Columbia River Basin are not self-sustaining at the present time. There is also anecdotal evidence that resident rainbow trout contribute to anadromous run abundance. This phenomenon would reduce estimates of the natural steelhead replacement ratio (62 Fed. Reg. 43949; August 18, 1997).

The primary cause for concern for steelhead in this ESU is the extremely low estimate of adult replacement rate. The dramatic declines in natural run sizes and inability of naturally spawning steelhead adults to replace themselves suggest that if present trends continue, this ESU will not be viable (62 Fed. Reg. 43950; August 18, 1997).

Steelhead spawn and rear in the Methow River. Steelhead juveniles range in the project vicinity, including the proposed project area (Foghorn ditch). However, neither steelhead spawning or steelhead redds have been documented in the project area as high spring flows and turbidity would preclude visual observation. Juvenile steelhead may migrate to the Methow River from tributaries seeking suitable rearing habitat, and use the Methow River as a migration corridor.

The Methow Basin supports both anadromous and resident forms of *O. mykiss*[1]. Resident forms are usually called rainbow or redband trout[2]. NMFS believes that resident fish cab help buffer extinction risks to an anadromous population by mitigating depensatory effects in spawning populations, by proviiding offspring that migrate to the ocean and enter the breeding population of steelhead, and by providing a "reserve" gene pool in freshwater that may persist through times of unfavorable conditions for anadromous fish. A particular concern is isolation of resident populations by human-caused barriers to migration. This interrupts normal population dynamics and population genetic processes and can lead to loss of a genetically based trait (anadromy).

B. UCR Spring Chinook

The UCR spring chinook salmon ESU was listed as endangered pursuant to the ESA on March 24, 1999 (64 Fed. Reg. 14308). Critical habitat for the UCR spring chinook salmon was designated on February 16, 2000 (65 Fed. Reg. 7764). The listing status, biological information, and other information for the UCR spring chinook salmon are further described in Attachment 2.

The species status reviews (NMFS 1998a, 1998b) cited references indicating that habitat degradation is the major cause for the range-wide decline in west coast chinook stocks. Habitat alterations that have affected chinook salmon include water withdrawal, conveyance, storage, flood control (resulting in insufficient flows, stranding, juvenile entrainment, and increased stream temperatures), logging and agriculture (resulting in loss of large woody debris,

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[1]Under certain conditions, anadromous and resident *O. mykiss* are apparently capable not only of interbreeding, but also of having offspring that express the alternate life history form, that is, anadromous fish can produce nonanadromous offspring, and vice versa (NMFS 1996a). Mullan *et al* (1992) found evidence that, in very cold streams, juvenile steelhead had difficulty attaining "mean threshold size for smoltification" and concluded that "Most fish here (Methow River, Washington) that do not emigrate downstream early in life are thermally-fated to a resident life history regardless of whether they were progeny of anadromous or resident parents."

[2]While there is currently no conclusive evidence regarding the relationship of resident and anadromous *O. mykiss*, NMFS believes available evidence suggests that resident rainbow trout should be included in listed steelhead ESUs in certain cases. Such cases include (1) where *O. mykiss* have the opportunity to interbreed with anadromous fish, and (2) where resident fish of native lineage once had the ability to interbreed with anadromous fish but no longer do because of human-made barriers.

sedimentation, loss of riparian vegetation, and habitat simplification) Spence *et al*, 1996: NMFS 1998a). Dams, mining and urbanization have also contributed to the partial depletion or extinction of certain chinook salmon stocks.

Other range-wide factors that impact indigenous west coast chinook salmon stocks include introduced or artificially propagated hatchery stock, commercial harvest, alteration of estuarine habitat, and natural fluctuations in marine environments (NMFS 1998a, 1998b).

Spring chinook salmon of this listed ESU that may be adversely affected by the proposed action spawn in the mainstem Methow River and certain tributaries both up and downstream from the Winthrop National Fish Hatchery. The UCR spring chinook salmon ESU occupies the Columbia River Basin upstream from Rock Island Dam to the United States - Canada border. The geographic area occupied by this ESU forms part of the larger Columbia Basin Ecoregion. The Methow River is located in the Okanogan Highlands Physiographic Province, and includes stream-type chinook salmon that spawn upstream of the Rock Island Dam in the Wenatchee, Entiat, and Methow rivers and their tributaries. The climate in this area includes extremes in temperatures and precipitation, with most precipitation falling in the mountains as snow. Streamflow in this area is provided by melting snowpack, groundwater, and runoff from alpine glaciers.

The proposed action would occur within designated critical habitat for the UCR spring chinook salmon. Defining specific river reaches that are critical for spring chinook salmon is difficult because of the current low abundance of the species and of our imperfect understanding of the species' freshwater distribution, both current and historical (65 Fed. Reg. 7764; February 16, 2000).

The NMFS' preferred approach to identifying the freshwater and estuarine portion of critical habitat is to designate all areas (and their adjacent riparian zones) accessible to the species within the range of each of each ESU (65 Fed. Reg. 7764; February 16, 2000). NMFS believes that adopting a more inclusive, watershed-based description of critical habitat is appropriate because it (1) recognizes the species' use of diverse habitats and underscores the need to account for all of the habitat types supporting the species' freshwater and estuarine life stages, from smaller headwater streams to migration corridors and estuarine rearing areas; (2) takes into account the natural variability in habitat use (e.g., some streams may have fish present only in years with plentiful rainfall) that makes precise mapping difficult; and (3) reinforces the important linkage between aquatic areas and adjacent riparian/ upslope areas (65 Fed. Reg. 7764; February 16, 2000).

Essential features of spring chinook salmon critical habitat include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space and safe passage conditions. Good summaries of these environmental parameters and freshwater factors that have contributed to the decline of spring chinook salmon and other salmonids can be found in reviews by Bjornn and Reiser, 1991; NMFS, 1996; NMFS 1998a and 1998b; and Spence *et al*, 1996.

UCR spring chinook have had a substantial portion of historical habitat blocked by Chief Joseph and Grand Coulee Dams on the mainstem Columbia River (NMFS 1998a, 1998b). There are local habitat problems related to irrigation diversions and hydroelectric development, as well as degraded riparian and instream habitat from urbanization and livestock grazing (65 Fed. Reg. 7764; February 16, 2000).

Previous assessment of stocks within this ESU have identified several as being at risk or of concern. Nehlsen *et al*, (1991) identified six stocks as extinct. Washington Department of Fisheries *et al*, (1993) considered nine stocks within the ESU, of which eight were considered to be of native origin and predominantly natural production. The status of all nine stocks was considered depressed. Populations in this ESU have experienced record low returns for the last few years (65 fed. Reg. 7764; February 16, 2000).

Recent total abundance of the UCR spring chinook salmon ESU is quite low, and escapements in 1994-1996 were the lowest in at least 60 years (65 Fed. Reg. 7764, February 16, 2000). At least six populations of spring chinook salmon populations in this ESU have become extirpated and almost all remaining naturally-spawning populations have fewer than 100 spawners (65 Fed. Reg., February 16, 2000). In addition to extremely small population sizes, both recent and long-term trends in abundance are downward, some extremely so. The Washington State Salmon and Steelhead Stock Inventory (SASSI, 1992) lists the Methow River spring chinook salmon stock as depressed, based on a long-term negative trend in escapement. Stock performance over the past decade would put them at the head of the "critical" class defined in the SASSI.

Because of poor returns of adult spring chinook salmon to the UCR ESU during recent years, the fish have been captured at the Wells Dam on the Columbia River and have been used to artificially supplement natural populations in this ESU. However, sufficient numbers of adult spring chinook returned this year to allow passage of fish to the Methow River and its tributary systems to naturally spawn. If adequate instream flows are available, it is possible that some of those returning fish may attempt to spawn naturally in the Methow River adjacent to the Winthrop hatchery. Juvenile spring chinook salmon are found in the Foghorn ditch and the Methow River adjacent to the Winthrop hatchery.

III. EVALUATING PROPOSED ACTIONS

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consulting regulations). The NMFS must determine whether the action is likely to jeopardize the listed and/or whether the action is likely to adversely destroy or modify critical habitat. This analysis involves the initial steps of (1) defining the biological requirements and current status of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In

making this determination, NMFS must consider the estimated level of mortality attributable to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both the survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential element of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat, it must identify any reasonable and prudent measures available.

Guidance for making determinations of jeopardy and adverse modification of habitat are contained in *The Habitat Approach, Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Anadromous Salmonids*, August 1999.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. The NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration and spawning of the listed salmon under the existing environmental baseline.

A. Biological Requirements

The first step in the methods NMFS uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. The NMFS also considers the current status of the listed species; taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NMFS starts with the determinations made in its original decision to list the species for protection under the ESA. Additionally, the assessment will consider any new information or data that are relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which time, protection under the ESA would be unnecessary. Species or ESUs not requiring ESA protection have the following attributes: population sizes large enough to maintain genetic diversity and heterogeneity, the ability to adapt to and survive environmental variation, and are self-sustaining in the natural environment.

The biological requirements for both UCR steelhead and spring chinook include food (energy) source, flow regime, water quality, habitat structure, passage conditions (migratory access to and

from potential spawning and rearing areas), and biotic interactions (Spence, *et al*, 1996).

The NMFS has related the biological requirements for listed salmonids to a number of habitat attributes, or pathways, in the Matrix of Pathways and Indicators (MPI). These pathways (Water Quality, Habitat Access, Habitat Elements, Channel Condition and Dynamics, Flow/Hydrology, Watershed Conditions, Disturbance History, and Riparian Reserves) indirectly measure the baseline biological health of listed salmon populations through the health of their habitat. Specifically, each pathway is made up of a series of individual indicators (e.g. indicators for Water Quality include Temperature, Sediment, and Chemical Contamination) that are measured or described directly (see NMFS 1996). Based on measurement or description, each indicator is classified within a category of the properly functioning condition (PFC) framework: (1) properly functioning, (2) at risk, or (3) not properly functioning. Properly functioning condition is defined as "the sustained presence of natural habitat forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation."

B. Factors Affecting the Species in the Action Area

Section 4(a)(1) of the ESA and NMFS listing regulations (50 C.F.R. § 424) set forth procedures for listing species. The Secretary of Commerce must determine, through the regulatory process, if a listed species is endangered or threatened based upon any one or a combination of the following factors; (1) the present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; or (5) other natural or human-made factors affecting its continued existence.

The proposed action includes activities that would have some level of effects with the potential for long-term impacts from the first and fifth category. The characterization of these effects and a conclusion relating the effects to the continued existence of both UCR steelhead and spring chinook salmon are provided below, in section IV: Analysis of Effects.

The major factors affecting steelhead and spring chinook salmon within the action area include instream flows and channel conditions and dynamics. The NMFS uses the MPI to analyze and describe the effects of these factors on listed steelhead and spring chinook salmon. As described above, the MPI relates the biological requirements of listed species to a suite of habitat variables. In the MPI analysis presented here, each factor is considered in terms of its effect on relevant pathways and associated indicators (properly functioning, at risk, or not properly functioning).

1. Instream Flows

The Methow River drains southward for more than 80 miles through western Okanogan County before emptying into the Columbia River near the town of Pateros. The Methow River is fed by snow melt, rain, and ground water. High flows from snow melt occurs from mid-April through the end of July with a peak around the first of June. The Methow River experiences low stream

flow from the end of August through the end of March. Upstream from Winthrop, low flows during winter can freeze solid down to the river bed in certain reaches, although substantial volumes of water continue to flow down valley underground (Caldwell and Catterson, 1992). The relationship between surface and ground water is complex because the surface water can disappear and reappear in different reaches as it flows downstream; the ground water can reverse its direction of flow as the water level drops in the Methow River; and it uncertain as to where all the water goes when irrigation diversions cease (Caldwell and Catterson, 1992).

Sands and gravels deposited by past melted glaciers are the principal Methow Valley aquifer. Along the Methow River and its tributaries, these sands and gravels are so porous and permeable that a high degree of hydraulic continuity is virtually guaranteed as the ground water and surface water exchange rapidly under certain conditions (Peterson and Larson, 1991).

This high degree of hydraulic continuity is demonstrated when certain reaches of the mainstem Methow River upstream of the Weeman bridge (RM 59.7) go dry during drought years from August through October and freeze solid from December through February. This is because the upper level of the ground water aquifer is the same as the surface water level in the Methow River. If the water depth of the Methow River is one foot and the ground water aquifer drops one foot due to pumping of wells, then the Methow River is dry even though a large quantity of water is flowing downstream through the gravels under the bed of the Methow River (Caldwell and Catterson, 1992).

Human-induced factors that affect instream flows include water diversions for agriculture, grazing and domestic uses; forestry; loss or conversion of riparian habitat to other private uses; the construction of levees and dikes for flood control; road construction; and, other land management actions conducted in the Methow Basin.

In the MPI analysis, instream flows fall under the Flow/Hydrology pathway, and Change in Peak/Base Flow indicator. Currently, for the reasons described above, this indicator is not properly functioning. In this instance, not properly functioning is defined as "pronounced changes in peak flow, base flow and/or flow timing relative to an undisturbed watershed of similar size, geology and geography."

2. Channel Conditions and Dynamics

The geology of the Methow River basin, in concert with the watershed's hydrology (precipitation and runoff patterns) has shaped the physical character of its watercourses. Stream channels respond to changes in stream discharge, sediment loading, and riparian vegetation conditions. Stream habitat quality and abundance are a function of conditions of riparian vegetative assemblages, channel morphology and stream flows, with temporal and spatial influences of natural and human-induced disturbances affecting the condition of these three components (Andonaegui, 2000).

In the Methow watershed, numerous high-energy watercourses drain steep slopes carrying

melted snowpack and stream bed materials. These streams drain into the U-shaped valley troughs and valley bottoms with deep deposits of glacial outwash and alluvium. Here these watercourses meander and braid, with the stream meander zone widths defined by the underlying geology of rock and clay outcrops. Patterns of channel flows within these meander zones are further defined by the duration of sustained high flows, water velocities, and the type and quantity of bedload material and large woody debris moved through the system (Andonaegui, 2000).

The Methow River is the principal hydrologic feature in the valley, bisecting the valley from Lost River to Winthrop. In many areas, particularly above Winthrop, the Methow River displays the characteristics of a braided stream, with interlaced and divergent channels and the development of gravel and boulder bars. The river course migrates within a broader stream meander zone as a result of inadequate stream energy to transport and rearrange bedload materials and large woody debris traveling through the system (EMCON 1993). Downstream from Winthrop to below Twisp, the river channel is better confined within the fluvial valley fill sediments. Dikes constructed in the upper and lower Methow River watershed affect water velocities, thereby altering bedload deposition and channel migration patterns. In the MPI analysis, Floodplain Connectivity and Width/Depth Ratio indicators (Channel Condition and Dynamics pathway) in the project area are functioning at risk.

C. Environmental Baseline

The environmental baseline represents the current basal set of conditions to which the effects of the proposed action would be added. The term "environmental baseline" means "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process." 50 C.F.R.§ 402.02. The term "action area" means "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." Id.

Critical habitat for both steelhead and spring chinook salmon includes the Methow River and to all tributaries where anadromous fish range. Direct effects within the action area extend from the mouth of the Foghorn ditch at the Methow River to the bypass return flow located approximately 1.3 miles downstream of the Winthrop hatchery. Bypass return flow from the Methow State Fish Hatchery is returned to the Methow River 0.25 mile downstream of the Foghorn ditch intake. There is no return of water diverted from the Methow River by the Foghorn Ditch Irrigation Company. The precise downstream limit of the action area cannot be easily determined, because the extent of effects of the proposed action would vary according to flow stage.

Access to a substantial portion of historical habitat for both steelhead and spring chinook salmon was blocked by the construction of Chief Joseph and Grand Coulee Dams on the mainstem Columbia River. For both the UCR steelhead and spring chinook salmon ESUs, there are also

local habitat problems related to irrigation diversions, degraded riparian and instream habitat from urbanization, land conversion to crops and orchards, livestock grazing, and timber harvest (NMFS 1996a, 1996b, 1997, 1998a, 1998b).

The project area reach (Foghorn ditch intake and downstream 1.3 miles, or more) lies within the Middle Methow River subwatershed. This subwatershed contains 15,600 acres, encompassing the mainstem Methow River from its confluence with the Chewuch River at Winthrop downstream to the town of Carlton, a distance of approximately 23 river miles. It includes the Alder Creek, Bear Creek, beaver Creek and Benson Creek drainages and the towns of Twisp and Carlton.

County roads and state highways parallel both sides of the Methow River along its entire length within this subwatershed. State Highway 20 parallels and confines the Methow River floodplain from Winthrop (RM 50) to just upstream of the Beaver Creek confluence at RM 35.2. Roads constructed within the river corridor have eliminated mature ponderosa pines and permanently removed riparian vegetation. Bank hardening (riprap) has been applied along several locations within this subwatershed.

Several dikes have been constructed in the active floodplain in this subwatershed, blocking fish access to side channel habitat important for juvenile salmonid rearing. Some of those side channels have been filled, or have improperly functioning culverts, or no culverts. The conversion of floodplain areas to agricultural, residential and commercial use has occurred and continues throughout the Methow Valley.

Past livestock grazing practices within riparian zones of the mainstem Methow River have negatively impacted these areas. On-going livestock grazing practices on private lands continue to have negative impacts in riparian areas. Agricultural practices and timber harvest has reduced riparian habitat in this subwatershed.

Large woody debris in this subwatershed is lacking. Historical practices of removing these materials now coupled with high flow events continue to suppress accumulations of large woody debris in this reach. Also, high velocity flows exacerbated by channel confining structures (i.e., dikes, riprap and roads) tend to transport those materials downstream out of this river reach.

The Alder Creek mine has introduced elevated levels of cadmium, copper, selenium, and zinc in the water and sediments of Alder Creek. Those heavy metals have been detected in the water at the confluence with the Methow River. Metals exceeding water quality criteria at the confluence of Alder Creek and the Methow River pose a risk to juvenile salmonids.

The Methow Valley Irrigation District withdraws about 41 cfs flow from the Methow River at RM 44.8 near Twisp, contributing to low instream flows during baseflow periods (late summer-early fall) prior to ditch shutoff.

Based on all the above information, NMFS concludes that not all of the biological requirements

of the listed steelhead and spring chinook salmon for freshwater habitat in general are being met under the environmental baseline in this watershed. The status of the species is such that there must be significant improvement in the environmental conditions they experience, over those presently available under the environmental baseline, to meet the biological requirements for survival and recovery of the species. Further degradation of these conditions could significantly reduce the likelihood of survival and recovery of these species due to the amount of risk the listed steelhead and spring chinook salmon already face under the current environmental baseline.

IV. ANALYSIS OF EFFECTS

A. Effects of the Proposed Action

NMFS' ESA implementing regulations define "effects of the action" as "the direct and indirect effects of an action on the species or critical habitat together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline" (50 C.F.R. § 402.02). "Indirect effects" are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur (*ibid*).

1. Direct Effects

The proposed action (dredging) may result in incidental take (death, harassment and displacement) of juvenile steelhead and spring chinook salmon that may range in the project action area. Though neither spawning or the presence of redds has been documented in the Foghorn ditch for either steelhead or spring chinook salmon, juveniles of both species likely use the ditch for rearing habitat and/or refugia during high spring flows. Thus, it is possible that juvenile steelhead and/or spring chinook rearing in the project action area may be killed, harassed and/or displaced when seining to remove fish from the proposed dredging reach occurs or when dredging is conducted.

The potential for incidental take to occur would be minimized to a great extent or completely by the use of fine mesh seines, gently herding any juvenile fish from the ditch via the bypass flow channel that returns to the Methow River downstream from the hatchery. Flow in the ditch will be reduced to 3-5 cfs to facilitate removal of juvenile fish as well as provide sufficient flow for juvenile coho rearing at the Winthrop hatchery. In addition, an aluminum 3/32" perforated screen will be installed at the Foghorn ditch intake to prevent any fish from entering the ditch while dredging work occurs. Fish removal from the ditch would be conducted during the early morning hours when water temperatures are coolest. Experienced fisheries personnel will remove fish from the work site. No capturing or handling of fish would occur.

Silt and sand removal (dredging) from the ditch is expected to generate water turbidity and sediment transport in the water column into the return flow bypass channel. A portion of the ditch flow will be routed through the Winthrop hatchery back channel system where most of the

sediment will settle out before reaching the bypass return channel. Because of the low gradient of the bypass channel, low flow condition, and 1.3-mile distance downstream to the Methow River, no sediment deposition in the Methow River will occur. The 1.3 mile section bypass channel from its confluence with the Methow River to the Foghorn ditch will be snorkeled and walked to inventory fish.

2. Indirect Effects

An indirect effect of the proposed action would be the increased diversion of an additional 20 cfs of flow from the Methow River at the Foghorn ditch intake. That quantity of water represents approximately 10% of the available surface flow (approximately 220 to 200 cfs) that can be found in the Methow River action area during low baseflow periods (Sept.-Oct. and Dec.-Mar.), as calculated using the 90% exceedence-frequency hydrograph at the Winthrop gage at RM 49.8 (Caldwell and Catterson, 1992). The proposed removal of up to 20 cfs additional flow would coincide with the low baseflow conditions found in early fall and mid-winter periods referenced above. The following is an analysis of low instream flow conditions, including the proposed diversion of 20 cfs, on UCR steelhead and UCR spring chinook salmon.

a. UCR Steelhead

The *Methow River Basin Fish Habitat Analysis Using the Instream Flow Incremental Methodology* (IFIM) indicates that high instream flows in spring would coincide with steelhead returning to spawn in the mainstem Methow or its tributaries. Optimal flow conditions would normally be in effect from March through July (when spawning occurs), then start tapering off during August until baseflow conditions are in effect by late September-October. Because of the high flows found during spring in the Methow River, the effect of the diversion of 20 cfs flow would not likely be measurable to spawning steelhead in the action area. Further, both hatcheries return either the full amount of water they divert from the river or add more flow because they also use wells as a water source (Winthrop hatchery bypasses 17 cfs and the Methow hatchery returns 8 cfs). It should also be noted that the Methow State Fish Hatchery bypass return flow is located 0.25 mile downstream of the Foghorn ditch intake, thus reducing the affect of water diversion within the action area on spawning steelhead.

Steelhead embryos develop for a period of one to several months, depending on water temperature and dissolved oxygen availability, before hatching occurs. Incubating eggs or alevins (hatched larval stage fish) may still be in the gravels when flows would naturally begin dropping below optimal conditions. Operating the Foghorn ditch would contribute to naturally declining flow conditions in late summer that could affect developing embryos or strand alevins still in the gravel, potentially resulting in hindered embryonic development and/or death. Steelhead eggs or alevins may also be at a higher risk for dewatering/stranding where spawning fish have deposited their eggs at the margins of streams.

Operation of the Foghorn ditch to divert water would contribute to the already declining instream flows in the project area during late summer-early fall; thus decreasing the quantity of refugia

habitat available to juvenile steelhead to avoid predators, reducing the availability of food, and concentrating fish to compete for space and food. These impacts would be ameliorated, in part, by increased bypass flow returns from the hatcheries at 0.25 mile and 1.3 miles downstream from the Foghorn ditch intake.

Migrating juvenile fish are particularly vulnerable to predation because they often are concentrated and may move through areas with limited cover and a high abundance of predators. The middle Methow River subwatershed has been modifed by land management actions that have removed habitat complexity (riparian vegetation and large woody debris) needed for juvenile salmonids. Increasing the quantity of water diverted by the Foghorn ditch during natural declining flow conditions, particularly during late summer-early fall, could increase competition among juvenile steelhead for shelter/cover, food, and space in the project area reach. It is important to note that the Middle Methow River Watershed remains watered year round, and thus provides important migratory and refugia habitat when certain upstream reaches of the Methow River dewater and flows become subsurface. The project action area is not believed to impede the migration of any life stage of steelhead.

Based upon the flow data available, it appears that operating the Foghorn ditch diversion as proposed will reduce low baseflow instream flow by as much as 20 cfs for the 0.25 mile river reach between the Foghorn ditch point of diversion and the Methow State Fish hatchery bypass return. The return of 8 cfs flow to the Methow River from the hatchery would then be a net reduction of 12 cfs in the river from the flow baseline for approximately 1 mile downstream, where approximately 17 cfs bypass flow from the Winthrop hatchery is returned to the Methow River. At that point a slight net gain in river flow may occur.

b. UCR Spring Chinook Salmon

Naturally declining flows towards seasonal low baseflow conditions in the Methow River would coincide with spring chinook salmon returning to spawn. Most spring chinook spawning appears to occur in the Upper and Lower Methow River watershed and its major tributaries. However, a spring chinook redd survey conducted in the Methow River basin in 1988 indicated 6 redds were found between Winthrop and Twisp (Middle Methow watershed), a distance of approximately 10 river miles (Kohn *as cited* in Caldwell and Catterson, 1992).

Chinook salmon will spawn in depths from a few centimeters to several meters, which suggests the range in depths that chinook find acceptable is very broad (Groot and Margolis, 1991). Optimum spawning depths for chinook are considered to be 0.8 feet (Thompson 1972). Instream flow, including the 20 cfs Foghorn ditch diversion, would remain at approximately 200-190 cfs between the ditch intake and the State hatchery bypass return 0.25 mile downstream. Approximately 8 cfs would be returned to the river, thus resulting in a net reduction of 12 cfs instream flow downstream for approximately 1 mile. At that point bypass return flow from the Winthrop hatchery would return approximately 17 cfs. This proposal is not expected to result in measurably dewatering any of the action area or preventing spring chinook from spawning because of the lack of instream flow or instream depth.

Flow conditions during incubation can have a dramatic effect on the survival of incubating eggs. Experiments have demonstrated that aside from large floods, chinook egg mortality was associated with low oxygen in the spawning gravel (less than 5 ppm) and poor percolation of water through spawning gravel (Groot and Margolis 1991). Adequate water percolation through the spawning gravels is essential for egg and alevin survival. The proposed action is not expected to result in any river reach dewatering, nor prevent/diminish the survival of any chinook redds in the action area. Instream flows in the action area, with the diversion in effect, would be approximately 200-190 cfs through the fall. Mid- winter flows would be approximately 180-170cfs, using the 90% exceedence-frequency hydrograph at the Winthrop gage (Caldwell and Catterson, 1992).

Adult spring chinook migrate up the Methow River from May through July, their spawning migration coinciding with high flows that would allow them to reach spawning tributaries in headwater reaches. This proposed action would not preclude or hinder migratory spring chinook returning to spawn.

Migrating juvenile fish are particularly vulnerable to predation because they are often concentrated and may move through areas with limited cover and a high abundance of predators. The Middle Methow watershed has been modified by land management actions that have removed habitat complexity (riparian vegetation and large woody debris) needed for juvenile salmonids. Increasing the quantity of water diverted from the Methow River during low baseflow conditions would increase competition among juvenile chinook for shelter/cover, food, and space within the action area. Those conditions would be expected to improve with bypass return flows of 8 cfs at 0.25 mile and approximately 17 cfs 1.3 miles downstream of the Foghorn ditch intake. At certain times, bypass return flows will actually be more than what was removed by the diversion because of well water augmentation for hatchery uses. Most of the habitat indicators in the environmental baseline in the Middle Methow River watershed are functioning "at risk" or are "not properly functioning" for spring chinook salmon. NMFS strongly believes, within the context of this proposed action, that restoring flows, riparian habitat, and instream habitat complexity would promote conservation of listed species and aid in the long-term restoration of habitat. The proposed action would maintain or slightly increase instream flows in the Middle Methow watershed, though instream flow in certain portions of the action area would be reduced by 20-12 cfs.before bypass flows are fully returned to the Methow River 1.3 miles downstream of the Foghorn ditch intake.

B. Effects on Critical Habitat

The NMFS designates critical habitat for a listed species based upon physical and biological features that are essential to that species. Essential features of this critical habitat include substrate, water quality/quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. (65 Fed. Reg. 7764, February 16, 2000). These requirements have been related to pathways and indicators within the MPI.

The direct and indirect effects discussed previously identify that the proposed action would

modify critical habitat for both steelhead and spring chinook salmon to a minor extent. The avenues in which critical habitat may be affected are disclosed in the MPI analysis; specifically, in the Water Quality, Habitat Elements, Channel Conditions and Dynamics, and Flow/Hydrology pathways. Within these pathways, most indicators will remain at risk over the long-term. The exception is the Flow/Hydrology MPI indicator that may slightly improve as bypass flow, augmented with well water, may actually increase flow in the Middle Methow River watershed. Relating these indicators back to the essential features of critical habitat, the primary impact of the proposed action would be a short-term increase in turbidity and suspended sediments (water quality) and a decrease of 20 cfs of instream flow in the 0.25 mile reach of the Methow River downstream of the Foghorn ditch intake. The remainder of the 1.3-mile reach of the Methow River downstream from the Foghorn ditch intake would have a reduction of 12 cfs from baseline flows.

The NMFS believes the long-term benefits to essential features of critical habitat for both steelhead and spring chinook salmon would include a slight increase in instream flow when well water and bypass flows from both the Methow State Fish Hatchery and the Winthrop National Fish Hatchery are returned to the Methow River 1.3 miles downstream of the Foghorn ditch diversion.

C. Cumulative Effects

Cumulative effects are defined as "those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." (50 C.F.R.§ 402.2). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Gradual improvements in habitat conditions for salmonids are expected on federal lands as a result of Northwest Forest Plan implementation. Significant improvements in UCR steelhead and UCR spring chinook salmon production outside of the U.S. Forest Service and Bureau of land Management lands is unlikely without changes in forestry, agricultural, and other practices occurring with non-Federal riparian areas. The NMFS is aware that significant efforts, such as the Omak Creek Watershed Plan (1995) and the Salmon, Steelhead and Bull Trout Habitat Limiting Factors Report (2000), have been developed to improve conservation and restoration of steelhead and chinook salmon habitat on non-Federal land. Local improvements to currently degraded habitat conditions may occur as a result of water diversion upgrades being planned in the Methow Basin.

NMFS assumes that future private and state actions will continue at similar intensities as in recent years. Now that the UCR steelhead and spring chinook salmon ESUs aare listed under the ESA, NMFS assumes that non-Federal landowners in those areas will also take steps to curtail or avoid land management practices that would result in the take of those species. Such actions are prohibited by section 9 of the ESA and subject to the incidental take permitting process under section 10 of the ESA. Future federal actions, including the on-going operation of hatcheries,

harvest, and land management activities, will be reviewed through separate section 7 processes.

V. CONCLUSION

Access to a substantial portion of historical habitat for both steelhead and spring chinook salmon was blocked by the construction of Chief Joseph and Grand Coulee Dams on the mainstem Columbia River. Because of this reduction in access to historical habitat, and because of the relatively pristine habitat conditions in the upper watersheds of the Methow Basin, accessible habitat in the methow Basin assumes a significance in the survival and recovery of these ESUs disproportionate to the amount of habitat in these watersheds. Consequently, NMFS must closely scrutinize land management actions in the basin that could significantly degrade this important habitat.

The applicant's proposal to dredge the Foghorn ditch to ensure an adequate water supply to the Winthrop National Fish Hatchery, Methow State Fish Hatchery, and the Foghorn Ditch Irrigation Company will slightly degrade instream flows in the 1.3-mile action area downstream of the Foghorn ditch intake on the Methow River. However, hatchery bypass flows, when coupled with well water used to supply the hatcheries'operational needs, are expected to provide an equal or slight net increase in instream flow in the Middle Methow watershed. Thus, it is expected the proposed action will not appreciably reduce the likelihood of survival and recovery of the listed species.

The NMFS concludes that the proposed action will not jeopardize the continued existence of UCR steelhead or UCR spring chinook salmon or result in the destruction or adverse modification of critical habitat within the action area. The determination of no jeopardy or the adverse modification of critical habitat is based upon the current status of the species, the environmental baseline for the action area, and the effects of the proposed action.

VI. REINITIATION OF CONSULTATION

Consultation must be reinitiated if (1) the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; or (3) a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R.§ 402.16).

VII. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing

behavioral patterns such as breeding, spawning, rearing, feeding, migrating, and sheltering (50 C.F.R.§ 222.106; 64 Fed. Reg. 60727). Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

A. Amount or Extent of the Take

The NMFS anticipates that the action covered by this biological opinion may result in incidental take of listed species through direct harm, injury and/or death to juveniles from in-water dredging and removal of fish from the work area using seines, and from diminishment of instream flows caused by diverting 20cfs of flow from the Methow River. Take may also occur by temporarily displacing listed fish from the Foghorn ditch down the bypass flow before returning to the Methow River. The NMFS does not expect any additional take through indirect impacts of the proposed activities. Any take from the proposed action, would be minimized by the reasonable and prudent measures and terms and conditions. Effects of the action such as these are largely unquantifiable, but are not expected to be measurable as long-term effects on the species' habitat or population levels. The best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the listed species themselves. In instances such as this, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the action covered by this biological opinion.

B. Reasonable and Prudent Measures

The following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize take of the listed species. These RPMs are integrated into the BA and proposed project, and NMFS has included them here to provide further detail as to their implementation.

1. Incorporate best management practices (BMPs) to reduce potential impacts of equipment staging, streambank and any instream dredging activities.

2. Safely remove listed juvenile fish from the work area prior to initiating any in-water dredging work.

3. Apply appropriate timing restrictions to minimize potential take.

C. Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the U.S. Fish and Wildlife Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. Implement RPM #1 by conducting the following:

    a. Reduce flow in the Foghorn ditch to aid in the removal (seine herding) of juvenile fish downstream to the hatchery bypass return and to reduce the potential for introducing sediment into the bypass channel and the Methow River.

    b. A spill prevention, control, and containment plan will be implemented.

    c. Hydraulic fluid in heavy equipment will be replaced with mineral oil or other biodegradable, non-toxic hydraulic fluid.

    d. All heavy equipment will be clean and free of external oil, fuel, or other potential pollutants.

    e. Sediment control measures such as using the Winthrop hatchery settling back channel will be used to intercept and preclude sediment transport down the bypass channel to the Methow River.

2. Implement RPM #2 by conducting the following:

    a. Use of small mesh seines by experienced fisheries personnel to gently herd listed juvenile salmonids in the ditch downstream to the Winthrop hatchery fish screen chamber and bypass channel prior to any dredging.

    b. Fish removal from the ditch will occur in the early morning hours when water temperatures are coolest, reducing potential thermal stress to listed juvenile fish.

    c. No capturing or handling of juvenile fish will occur.

    d. Snorkeling and walking surveys will be conducted to assure all listed fish are removed from the ditch and into the bypass channel.

    e. In the event that steelhead or spring chinook salmon are killed or injured, the U.S. Fish and Wildlife Service shall immediately report to NMFS, Washington State Habitat Branch, the circumstances under which take occurred and the measures immediately employed to preclude additional take.

3. Implement #3 by conducting the following:

   a. Construction will take place within the time period stipulated by the Washington department of Fish and Wildlife in their Hydraulic Project Approval.

   b. Dredging will be completed within one week of project commencement.

VIII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop additional information.

The NMFS would encourage USFWS to minimize to the extent practicable the use of water diverted from the Methow River for hatchery operations. This would help conserve surface water in the mainstem Methow River necessary for all life stages of listed fish residing in the river, aid in restoring riparian conditions, and help restore floodplain conditions.

The NMFS must be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat. Accordingly, NMFS requests notification of the implementation of any conservation recommendations.

IX. ESSENTIAL FISH HABITAT

A. Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§ 305(b)(2));

- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));

- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation

recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including the individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.
The objective of this EFH consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid , minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed action.

B. Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific samon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts to these species' EFH from the proposed action is based, in part, on this information.

C. Proposed Actions

The proposed actions and action area are detailed above in the Background, Description of the Proposed Project, and Environmental Baseline sections of this BO. The action area includes

habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

D. Effects of Proposed Action

The proposed action may result in detrimental short- and long-term impacts to a variety of habitat parameters. These adverse effects are: 1) temporary increases in turbidity; and 2) the use of heavy machinery adjacent to the Foghorn ditch may introduce contaminants into the water; and 3) a reduction of instream flow in a 1.3 mile reach of the Methow River.

E. Conclusion

NMFS believes that the proposed action may adversely impact designated EFH for chinook and coho salmon.

F. EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NMFS understands that the conservation measures described in the BO will be implemented by the USFWS, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, Terms and Conditions 1b-1d, in Section VII of this BO are adequate to address these adverse impacts to the maximum extent practicable. Consequently, NMFS recommends that they be adopted as EFH conservation measures. If implemented by the USFWS, these measures will minimize the potential impacts of the proposed project and conserve EFH.

G. Statutory Response Requirement

Please note that the Magnuson-Stevens Act and 50 CFR 600.920(j) require the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. In the case of a response that is inconsistent with the EFH Conservation Recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

H. Supplemental Consultation

The USFWS must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

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